



Entergy Operations, Inc.  
1340 Echelon Parkway  
Jackson, MS 39213  
Tel 601-368-5138

**Ron Gaston**  
Vice President, Regulatory Assurance

10 CFR 50.90

0CAN022201

February 17, 2022

ATTN: Document Control Desk  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

Subject: Response to the Second Request for Additional Information  
License Amendment Request for One-Time Change to Support Proactive  
Upgrade of the Emergency Cooling Pond Supply Piping

Arkansas Nuclear One, Units 1 and 2  
NRC Docket Nos. 50-313 and 50-368  
Renewed Facility Operating License Nos. DPR-51 and NPF-6

By Reference 1, as supplemented by Reference 2, Entergy Operations, Inc. (Entergy) requested license amendments for Arkansas Nuclear One, Unit 1 and Unit 2 (ANO-1 and ANO-2) concerning Emergency Cooling Pond (ECP) Technical Specifications (TSs) ANO-1 TS 3.7.8 and ANO-2 TS 3.7.4.1. The proposed amendments would allow the ECP to remain operable on a one-time basis for up to 65 days to perform proactive upgrades to the ECP supply piping. In Reference 1, Entergy stated that this change would allow Entergy the time to perform upgrades on piping from the ECP to the Service Water System (SWS) intake bays prior to a spring outage for each unit.

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the application and determined that additional information was required (Reference 3).

In association with the response to Request for Additional Information (RAI) STSB-9, new TS Page Markups (Enclosure, Attachment 1), TS Bases Page Markups (Enclosure, Attachment 2), and Re-Typed TS Pages (Enclosure, Attachment 3) are included.

As noted in the enclosed response to RAI STSB-4, Entergy has eliminated the reference to "regulatory commitments" and replaced it with "compensatory measures". These compensatory measures are identified in Enclosure, Attachment 4 of this submittal. Based on this response, Entergy is rescinding the regulatory commitments identified in Enclosure, Attachment 4 of the Reference 1.

The responses to the RAIs do not affect the no significant hazards consideration provided in Reference 1.

If there are any questions or if additional information is needed, please contact Riley Keele, Manager, Regulatory Assurance, Arkansas Nuclear One, at 479-858-7826.

I declare under penalty of perjury; that the foregoing is true and correct.  
Executed on February 17, 2022.

Respectfully,

Ronald  
Gaston

Ron Gaston

Digitally signed by  
Ronald Gaston  
Date: 2022.02.17  
09:28:23 -06'00'

RWG/rwc

- References:
1. Entergy Operations, Inc. (Entergy) letter to the U. S. Nuclear Regulatory Commission (NRC), "License Amendment Request for One-Time change to Support Proactive Upgrade of the Emergency Cooling Pond Supply Piping," (0CAN022102) (ADAMS Accession No. ML21039A756), dated February 8, 2021
  2. Entergy letter to the RC, "Response to Request for Additional Information License Amendment Request for One-Time Change to Support Proactive Upgrade of the Emergency Cooling Pond Supply Piping," (0CAN092102) (ADAMS Accession No. ML21266A413), dated September 23, 2021
  3. NRC email to Riley Keele (Entergy), "ANO-1 and 2 Final RAI #2 RE: License Amendment Requests to Allow the ECP to Remain Operable On a One-Time Basis for Up to 65 days to Perform Piping Upgrade (L-021-LA-0015)," (0CNA012203), (ADAMS Accession No. ML22020A082), dated January 19, 2022

Enclosure: Response to Second Request for Additional Information

Attachments to Enclosure:

1. Technical Specifications Page Markups
2. Technical Specification Bases Page Markups – Information Only
3. Retyped Technical Specification Pages
4. Compensatory Measures

cc: NRC Region IV Regional Administrator  
NRC Senior Resident Inspector – Arkansas Nuclear One  
NRC Project Manager – Arkansas Nuclear One  
Designated Arkansas State Official

**ENCLOSURE**

**0CAN022201**

**RESPONSE TO SECOND REQUEST  
FOR ADDITIONAL INFORMATION**

## **RESPONSE TO SECOND REQUEST FOR ADDITIONAL INFORMATION**

By Reference 1, as supplemented by Reference 2, Entergy Operations, Inc. (Entergy) requested license amendments for Arkansas Nuclear One, Unit 1 and Unit 2 (ANO-1 and ANO-2) concerning Emergency Cooling Pond (ECP) Technical Specifications (TSs) ANO-1 TS 3.7.8 and ANO-2 TS 3.7.4.1. The proposed amendments would allow the ECP to remain operable on a one-time basis for up to 65 days to perform proactive upgrades to the ECP supply piping. In Reference 1, Entergy stated that this change would allow Entergy the time to perform upgrades on piping from the ECP to the Service Water System (SWS) intake bays prior to a spring outage for each unit.

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the application and determined that additional information was required (Reference 3).

Below are the RAIs and the associated Entergy responses.

### **RAI STSB-8**

In RAI STSB-4.b of the initial request for additional information, the NRC staff requested the licensee's response concerning the following issue:

Please specify the delay time or explain the term "delay."

In its letter dated September 23, 2021, the licensee stated, in part:

Entergy response considers inability to meet one of the regulatory commitments as a missed surveillance and will invoke either ANO-1 Technical Specifications SR 3.0.3 or ANO-2 Technical Specification SR 4.0.3 guidance.

The NRC staff notes that because the subject compensatory actions are not TS surveillances, TS SR 3.0.3/4.0.3 cannot be invoked for such actions. On failure to meet the compensatory actions, appropriate ECP-related TS LCO Conditions (i.e., LCO 3.7.8 for ANO-1 and LCO 3.7.4.1 for ANO-2) must be entered and Action(s) taken accordingly.

Please confirm your understanding and revise the previous response to RAI STSB-4.b, as necessary.

### **Entergy Response**

Entergy intended to define the term "without delay" consistent with, and analogous to, other TS surveillances. Entergy agrees with the NRC staff that the regulatory commitments, now "compensatory measures", are not TS surveillances and invoking Surveillance Requirement (SR) 3.0.3 and SR 4.0.3 guidance is not appropriate.

The temporary pumping system is capable of supplying the SWS from the ECP provided it can be aligned to at least two SWS bays during a loss of Lake Dardanelle event. Application of the LCO Note also requires several continuing compliance compensatory measures to be maintained during the 65-day ECP supply piping upgrade window. Because unforeseen circumstances could arise that may temporarily prevent meeting one or more of these continuing compliance compensatory measures, the ECP may be considered to remain operable provided action is initiated to restore the associated compensatory measure within 72 hours. The 72-hour Completion Time to restore the continuing compliance compensatory measure is consistent with the 72 hours allowed for rendering the temporary pumping system unavailable for testing. This allows for time to restore the compensatory measures when unforeseen circumstances temporarily prevent meeting the continuing compliance compensatory measures. In addition, failure to meet one or more of the continuing compliance compensatory measures does not immediately render the temporary pumping system unavailable. Therefore, replacing "without delay" with a 72-hour completion time is reasonable.

The revised response to RAI STSB-4.b is:

The one-time actions identified in Attachment 4 of the License Amendment Request (LAR) correspondence letter 0CAN022202, dated February 17, 2022, are performed prior to initial entry into the 65-day ECP piping upgrade window. Because unforeseen circumstances could arise that may temporarily prevent meeting one of the other continuing compliance compensatory measures during the maintenance window, Entergy considers the ECP to remain operable in such an event, provided action is taken to restore the compensatory measure within 72 hours. This is considered reasonable since failure to meet one or more continuing compliance compensatory measures does not immediately render the temporary pumping system unavailable.

The markup of the respective TS Bases included in Enclosure, Attachment 2 provides the Operator guidance necessary to properly apply the proposed LCO Note.

### **RAI STSB-9**

The licensee's proposed TS change modifies ANO-1 TS 3.7.8 and ANO-2 TS 3.7.4.1 with the addition of the following NOTE:

LCO      The ECP shall be OPERABLE.

----- NOTE -----

The ECP may be considered OPERABLE on a one-time basis for up to 65 days during upgrade of the ECP supply piping to the SWS intake bays provided:

- a. A loss of Lake Dardanelle event is not in progress, and
- b. A temporary pumping system is capable of supplying the SWS from the ECP. The temporary pumping system may be unavailable for testing or necessary maintenance provided its availability is restored within 72 hours, and
- c. The regulatory commitments described in the ANO License Amendment Request (LAR) correspondence letter 0CAN022102 Enclosure, Attachment 4 are implemented.

-----

Regarding the proposed Note c above, the NRC staff notes that regulatory commitments can be revised without NRC prior approval and, therefore, may not be relied upon by the staff as a basis for approval.

Consider alternative language for implementing compensatory measures as obligations under this LCO Note.

### **Entergy Response**

Entergy has eliminated the reference to "regulatory commitments" and replaced it with "compensatory measures". These compensatory measures are listed in Enclosure, Attachment 4. This change also affects Enclosure, Attachments 1 through 3 and revised versions are attached.

### **RAI SCPB-1**

In Section 3.2, "Justification," of the LAR, the licensee stated that the temporary ECP supply system is a commercial-grade, non-safety-related system being installed as a compensatory measure, and that the system will consist of high density polyethylene (HDPE) and carbon steel suction and discharge piping. The licensee also stated that the temporary piping and equipment will be restrained to limit movement and stresses due to wind, seismic, and thermal expansion

within ASME Code or Plastic Pipe Institute limits. However, the above statements do not identify the specific piping standards that will be used by the licensee in the design of the temporary system.

Please identify the specific standards for the HDPE piping, carbon steel piping, and the interconnection that will be applied in the design of the temporary ECP supply system.

### Entergy Response

The applicable section(s) of the following piping standards will be utilized to ensure the non-skid mounted temporary piping will withstand the applicable loading and environmental conditions.

The carbon steel piping portions of the temporary piping will utilize the environmental conditions described in Reference 1, Sections 3.2 and 3.4 and the following ANO piping design basis standards:

#### Unit 1

United States of America Standard (USAS) B31.1.0 - 1967 except use of American National Standards Institute (ANSI) B31.1.b -1973 Summer Addenda to ANSI B31.1 - 1973 for the following:

- Moments
- Section Modulus
- Stress Limits
- Flexibility Factors
- Stress Intensification Factors
- Design Load Combinations

#### Unit 2

American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code Section III – 1971 with Addenda through Summer 1971 and Code Case 1606-1, except use:

- ASME B&PV Code Section III – 1971 Winter 1972 Addenda  
Sections NC-3611.1(b)(4)(c) and NC-3650 with Code Case 1606-1, for the following:
  - Moments
  - Section Modulus
  - Design Loading Combinations
  - Stress Limits
- ASME B&PV Code Section III – 1974 Section NC-3673.2, for the following:
  - Flexibility Factors



- Stress Intensification Factors

High Density Polyethylene (HDPE) portions of the temporary piping will utilize the environmental conditions described in Reference 1, Section 3.2 and 3.4 and, as a minimum, the following design handbooks, technical notes, manuals and guidelines for Unit 1 and Unit 2:

- Plastic Pipe Institute Handbook of Polyethylene Pipe, Second Edition, 2008 and December 2021 errata.
- Technical Note PP 814-TN Engineering Considerations for Temperature Change, Performance Pipe, October 2018
- Technical Note PP 815-TN Above Grade Pipe Support, October 2018
- The Performance Pipe Field Handbook, Bulletin PP-901, May 2019
- AWWA Manual M55, First Edition, PE Pipe – Design and Installation
- American Lifelines Alliance, March 2005, Seismic Guidelines for Water Pipelines

The interface between the HDPE and the carbon steel piping will have a support anchor at the interface to limit the loads transferred between the two sections of pipe. Each pipe section at the interface will be designed using the codes, standards, and guides stated above for the pipe material.

The temporary pumping skid equipment will be of commercial design with industrial grade components intended for continuous operation in an exterior environment, using a pond water source requiring suction lift and self-priming capability.

### **RAI EMIB-3**

In the response to RAI EMIB-1 in the licensee's letter dated September 23, 2021, concerning how the minimum system flow requirements would be determined and why they would be sufficient to support the intended safety function of the ECP temporary pumping system, the licensee provided the following response:

In a conference call on August 18, 2021, the NRC Staff clarified that they were requesting information on how the full flow test will be performed. To perform the test, ANO will install the temporary pumping system into two SW pump bays and test the temporary system while the SW pumps are running, close the Lake Sluice gates and start the temporary pump. The test will verify the system minimum flow using flow meters, validate level control requirements are achieved in the SW Bays, and the system functions properly.

However, the intent of RAI EMIB-1 is to understand the licensee's basis for establishing that the pump design characteristics (e.g., capacity/flow rate) will meet the system functional requirements, not the performance of the pump testing.

Please describe how the minimum system flow requirements of the ECP temporary pumping system will be determined and why they will be sufficient to support the intended safety function.

#### Entergy Response

As described in Reference 1, Section, 3.2 under contingencies:

The temporary pumping system will be sized to provide adequate flow to support the safety-related equipment (Engineered Safety Features (ESF)) of both trains of the SWS to safely shutdown the unit under normal or accident conditions (the other ANO unit will maintain full ECP flow capacity from its normal ECP suction line).

#### Accident Condition

ANO-1's Safety Analysis Report (SAR) Table 9-15 identifies single loop Design Basis Accident (DBA) SW nominal flow of 6,255 gallons per minute (gpm) and the ANO-2's SAR Section 9.2.5.3 identifies a SW pump DBA flow of 9,500 gpm. The ANO-2 SW flow demand is much greater than the ANO-1 demand, and the ANO-2 flow requirements will bound the flow requirements for ANO-1.

The bounding minimum flow for the ESF alignment during a DBA is confirmed each refueling outage through the existing SWS surveillance test procedure for ANO-2. Flow acceptance criterion is provided to meet SW loads supplied with flow during the test. In addition, the test methodology calculation adds flow margin to the acceptance criterion to account for measurement uncertainty and SW loads that cannot be tested such as Emergency Feedwater pumps, spent fuel pool boil-off, boundary valve leakage, pump degradation, and system fouling. The measured SW flow must be equal or greater than the adjusted SW test criterion.

The temporary pumping system is being sized to provide approximately 21,000 gpm flow for two-loop operation which bounds the ANO-2 minimum flow for ESF alignment during a DBA.

#### Normal Condition

The temporary pumping system is also sized to provide sufficient flow to allow a normal shutdown utilizing two loops of SWS. This flow rate is greater than the DBA accident flow because several non-safety related loads are supplied during a normal shutdown. Flow required for a normal shutdown of ANO-2 again bounds the flow required for a normal shutdown of ANO-1.

ANO-2 operating history has been reviewed for SWS flow during normal shutdowns occurring at the same time of year (Spring) as the planned 65-day ECP supply piping upgrade window. The temporary pumping system capacity will provide approximately 21,000 gpm flow for two-loop operation, which will bound the higher ANO-2 SWS flow required for normal shutdowns.

By ensuring the temporary pumping system minimum flow requirements bound both the accident condition and the normal shutdown condition, the flow of the temporary pumping system will be sufficient to support the intended safety function.

## REFERENCES

1. Entergy Operations, Inc. (Entergy) letter to the U. S. Nuclear Regulatory Commission (NRC), "License Amendment Request for One-Time change to Support Proactive Upgrade of the Emergency Cooling Pond Supply Piping," (0CAN022102) (ML21039A756), dated February 8, 2021
2. Entergy letter to the NRC, "Response to Request for Additional Information License Amendment Request for One-Time Change to Support Proactive Upgrade of the Emergency Cooling Pond Supply Piping," (0CAN092102) (ML21266A413), dated September 23, 2021
3. NRC email to Riley Keele (Entergy), "ANO-1 and 2 Final RAI #2 RE: License Amendment Requests to Allow the ECP to Remain Operable On a One-Time Basis for Up to 65 days to Perform Piping Upgrade (L-021-LA-0015))," (0CNA012203), (ADAMS Accession No. ML22020A082), dated January 19, 2022

**ENCLOSURE, ATTACHMENT 1**

**0CAN022201**

**TECHNICAL SPECIFICATION PAGE MARKUPS**

**(5 Pages)**

## 3.7 PLANT SYSTEMS

## 3.7.8 Emergency Cooling Pond (ECP)

LCO 3.7.8 The ECP shall be OPERABLE.

## -----NOTE-----

The ECP may be considered OPERABLE on a one-time basis for up to 65 days during upgrade of the ECP supply piping to the SWS intake bays provided:

- a. A loss of Lake Dardanelle event is not in progress, and
- b. A temporary pumping system is capable of supplying the SWS from the ECP. The temporary pumping system may be unavailable for testing or necessary maintenance provided its availability is restored within 72 hours, and
- c. The compensatory measures described in the ANO correspondence letter 0CAN022201, dated February 17, 2022, Enclosure, Attachment 4 shall be implemented. Failure to meet one or more of the continuing compliance compensatory measures is acceptable provided the measure(s) is/are restored within 72 hours.

APPLICABILITY: MODES 1, 2, 3, and 4.

## ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Degradation of the ECP noted pursuant to SR 3.7.8.4 below or by other inspection.	A.1 Determine ECP remains acceptable for continued operation.	7 days
B. Required Action and associated Completion Time of Condition A not met.  <u>OR</u>  LCO not met for reasons other than Condition A.	B.1 Be in MODE 3.  <u>AND</u>  B.2 Be in MODE 5.	6 hours   36 hours

Move to next page

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.8.1	Verify that the indicated water level of the ECP is greater than or equal to that required for an ECP volume of 70 acre-ft.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.8.1	Verify that the indicated water level of the ECP is greater than or equal to that required for an ECP volume of 70 acre-ft.	In accordance with the Surveillance Frequency Control Program
SR 3.7.8.2	<p>-----NOTE-----</p> <p>Only required to be performed from June 1 through September 30.</p> <p>-----</p> <p>Verify average water temperature is <math>\leq 100</math> °F.</p>	In accordance with the Surveillance Frequency Control Program
SR 3.7.8.3	<p>Perform soundings of the ECP to verify:</p> <ol style="list-style-type: none"> <li>1. A contained water volume of ECP <math>\geq 70</math> acre-feet, and</li> <li>2. The minimum indicated water level needed to ensure a volume of 70 acre-feet is maintained.</li> </ol>	In accordance with the Surveillance Frequency Control Program
SR 3.7.8.4	Perform visual inspection of the ECP to verify conformance with design requirements.	In accordance with the Surveillance Frequency Control Program

Moved from  
Page 3.7.8-1

## PLANT SYSTEMS

### 3/4.7.4 EMERGENCY COOLING POND

#### LIMITING CONDITION FOR OPERATION

---

3.7.4.1 The emergency cooling pond (ECP) shall be OPERABLE<sup>1</sup> with:

- a. A minimum contained water volume of 70 acre-feet.
- b. An average water temperature of  $\leq 100$  °F.

APPLICABILITY: MODES 1, 2, 3 and 4.

#### ACTION:

- a. With the volume and/or temperature requirements of the above specification not satisfied or, with the requirements of Action b not met, be in at least HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours.
- b. If degradation is noted pursuant to 4.7.4.1.d below or by other inspection, perform an evaluation to determine that the ECP remains acceptable for continued operation within 7 days.

#### SURVEILLANCE REQUIREMENTS

---

4.7.4.1 The ECP shall be determined OPERABLE:

- a. In accordance with the Surveillance Frequency Control Program by verifying that the indicated water level of the ECP is greater than or equal to that required for an ECP volume of 70 acre-feet.
- b. In accordance with the Surveillance Frequency Control Program during the period of June 1 through September 30 by verifying that the pond's average water temperature at the point of discharge from the pond is within its limit.
- c. In accordance with the Surveillance Frequency Control Program by making soundings of the pond and verifying:
  1. A contained water volume of ECP  $\geq 70$  acre-feet, and
  2. The minimum indicated water level needed to ensure a volume of 70 acre-feet is maintained.
- d. In accordance with the Surveillance Frequency Control Program by performance of a visual inspection of the ECP to verify conformance with design requirements.

Note 1: The ECP may be considered OPERABLE on a one-time basis for up to 65 days during upgrade of the ECP supply piping to the SWS intake bays provided:

- a. A loss of Lake Dardanelle event is not in progress, and
- b. A temporary pumping system is capable of supplying the SWS from the ECP. The temporary pumping system may be unavailable for testing or necessary maintenance provided its availability is restored within 72 hours, and



## PLANT SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

---

- c. The compensatory measures described in the ANO correspondence letter 0CAN022201, dated February 17, 2022, Enclosure, Attachment 4 shall be implemented. Failure to meet one or more of the continuing compliance compensatory measures is acceptable provided the measure(s) is/are restored within 72 hours.

**ENCLOSURE, ATTACHMENT 2**

**0CAN022201**

**TECHNICAL SPECIFICATION BASES PAGE MARKUPS**

**INFORMATION ONLY**

**(7 Pages)**

## LCO

The ECP is a backup system that is required to be OPERABLE to support the SWS. To be considered OPERABLE, the ECP must contain a sufficient volume of water at or below the maximum temperature that would allow the SWS to operate for at least 30 days following the design basis event without exceeding the maximum design temperature of the equipment served by the SWS. To meet this condition, the ECP initial temperature should not exceed 100 °F, and the volume of water should not fall below 70 acre-feet during normal unit operation.

The LCO is modified by a Note which permits the ECP to be considered OPERABLE on a one-time basis for up to 65 days during upgrade of the ECP supply piping to the SWS intake bays provided:

- a. A loss of Lake Dardanelle event is not in progress, and
- b. A temporary pumping system is capable of supplying the SWS from the ECP. The temporary pumping system may be unavailable for testing or necessary maintenance provided its availability is restored within 72 hours, and
- c. The compensatory measures described in the ANO correspondence letter 0CAN022201, dated February 17, 2022, Enclosure, Attachment 4 shall be implemented. Failure to meet one or more of the continuing compliance compensatory measures is acceptable provided the measure(s) is/are restored within 72 hours.

For the purposes of the proposed LCO Note, a loss of Lake Dardanelle is considered an event that renders the Dardanelle Reservoir unavailable for an extended period of time, likely with no known time for recovery. Such events include failure of the downstream Dardanelle Dam, notification from the Army Corps of Engineers of more than a momentary draw down of lake level below 335 ft mean sea level (MSL), a major oil or chemical spill which renders Lake Dardanelle unfit for use to support cooling of station equipment, or any other event that would result in more than temporary lowering of the intake canal below 335 ft MSL.

Other events that may require short duration use of the temporary pumping system such as clogging of SWS traveling screens are controlled by station procedures and are not considered a loss of Lake Dardanelle event with respect to this LCO Note.

Once the LCO Note is applied, the Note may be reapplied during startup should a unit shutdown occur during the 65-day period. If a unit shutdown occurred early in the 65-day maintenance window, the LCO would be exited upon entry into Mode 5; however, the LCO Note may be reapplied when entering Mode 4 from Mode 5, with the start of the 65-day allowable period being retroactive to the initial application of the LCO Note prior to the unit shutdown. For example, if a unit shutdown occurs 10 days following the commencement of the ECP piping upgrade and the unit remains in Mode 5 for 12 days, the proposed LCO Note may be reapplied upon entry into Mode 4 during plant restart; however, the time remaining in the original 65-day ECP piping upgrade window has now been reduced to 43 days ( $65 - 10 - 12 = 43$ ).

The temporary pumping system is capable of supplying the SWS from the ECP provided it can be aligned to at least two SWS bays during a loss of Lake Dardanelle event. Application of this LCO Note also requires the following continuing compliance compensatory measures to be maintained during the 65-day ECP supply piping upgrade. Unforeseen circumstances could arise that may prevent meeting one or more measures listed below. The ECP will remain operable provided the associated measure(s) is/are restored within 72 hours.

- The temporary pump will be tested and minimum flow requirements verified prior to removing the installed ECP supply piping from service. (One-time action)
- The Army Corps of Engineers will be briefed on the ECP piping upgrade activities and on the increased sensitivity of Lake Dardanelle level during the period of the ANO ECP piping upgrade. The Army Corps of Engineers will be requested to minimize any activity and provide advanced notification of activity that could impact the lake level or amount of debris in the lake. (One-time action)
- The 65-day allowance for the ECP to remain operable during the ECP supply piping upgrade will be applied only prior to a spring outage to provide additional margin to the TS maximum ECP temperature limit. (One-time action)
- The temporary pump system will be started to ensure its continued availability at least weekly. (Continuing compliance compensatory action)
- Personnel trained to start the pump will be dedicated and onsite 24 hours a day during the ECP piping upgrade when the ECP temporary pump is being relied upon as a backup for the Dardanelle Reservoir, with direct communications with the respective Control Room. (Continuing compliance compensatory action)
- No elective maintenance or elective testing will be performed that could challenge the Dardanelle Reservoir SWS suction source. (Continuing compliance compensatory action)
- The SWS pumps, bays, traveling screens, and sluice gates that are important for ensuring cooling water is provided to the supported SSCs will be given protected train status. (Continuing compliance compensatory action)
- The intake traveling screens will be inspected for debris and general physical condition at least once per shift. (Continuing compliance compensatory action)
- The accessible portions of the temporary ECP system piping will be inspected weekly. (Continuing compliance compensatory action)
- Fish nets will be installed in the Dardanelle Reservoir SWS intake canal when required by existing winter operations procedural guidance and inspected for any gross physical damage or large quantities of debris twice a week, weather permitting, to ensure the nets remain intact and capable of performing the intended function. (Continuing compliance compensatory action)
- An adequate fuel supply will be maintained to supply the temporary pump for approximately 24 hours of continuous operation. (Continuing compliance compensatory action)
- At least once per week, a briefing will be conducted for applicable personnel to ensure individuals remain cognizant of the cues that would prompt operator action to start the temporary pumping system and open the discharge valve. (Continuing compliance compensatory action)
- The ECP level will be maintained  $\geq 5.5$  ft during the 65-day preventative maintenance window. (Continuing compliance compensatory action)
- The risk impact will be reassessed against the acceptance guidelines for a small risk increase as defined in RG 1.177 (Incremental Conditional Core Damage Probability (ICCDP)  $< 1E-6$  and Incremental Conditional Large Early Release Probability (ICLERP)

- < 1E-7) prior to removing the installed ECP supply piping from service during the 65-day preventative maintenance window and will inform the NRC before proceeding if either criterion is not met. (One-time action)

The one-time actions identified above are performed prior to initial entry into the 65-day ECP piping upgrade window. Because unforeseen circumstances could arise that may temporarily prevent meeting one of the other continuing compliance compensatory measures during the maintenance window, the LCO Note remains applicable (i.e., the ECP may be considered to remain operable) provided action is taken to restore the continuing compliance compensatory measures within 72 hours. This is considered reasonable since failure to meet one or more of the continuing compliance compensatory measures does not immediately render the temporary ECP pumping system unavailable.

Separate entry into the 72 hours is allowed for each continuing compliance compensatory measure specified above.

With the conditions associated with the LCO Note as defined above not met, the ECP may no longer be considered OPERABLE and Condition B becomes applicable.

---

## APPLICABILITY

In MODES 1, 2, 3, and 4, the ECP is a backup system that is required to support the OPERABILITY of the equipment serviced by the SWS and is required to be OPERABLE in these MODES.

In MODES 5 and 6, the OPERABILITY requirements of the ECP are determined by the systems it supports. Although the systems it supports may be required to be OPERABLE, the ECP is not required to meet the same OPERABILITY requirements in MODES 5 and 6 as it must in MODES 1, 2, 3, and 4. The definition of OPERABILITY embodies the principle that a system can perform its function(s) only if all necessary support systems are capable of performing their related support functions. If the supported system is capable of performing its safety function without reliance on the ECP, then the ECP is not required to be OPERABLE. Similarly, operation with the ECP in a less than fully qualified state is acceptable provided an assessment has been performed to determine that the supported system remains capable of performing its safety function. It is important to recognize that single failure criteria is not applicable in MODES 5 and 6. Therefore, the availability of Lake Dardanelle as a heat sink during periods of ECP unavailability may be acceptable provided the probability of a loss of lake and the time to respond to a loss of lake event are considered when planning ECP unavailability periods.

---

## ACTIONS

### A.1

If degradation is noted during performance of SR 3.7.8.4 or during other inspection, the impact on ECP OPERABILITY must be assessed. As discussed in the SR 3.7.8.4 Bases below, an engineering evaluation is performed of any apparent changes in visual appearance or other abnormal degradation to determine OPERABILITY. The Completion Time associated with this action is reasonable based on the low probability that a loss of the Dardanelle Reservoir would occur in any 7-day period. If, by evaluation, the ECP is determined to be inoperable at any point during the 7-day evaluation period, the ECP must immediately be declared inoperable and Action B applied.

## B.1 and B.2

If the ECP is inoperable, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

---

## PLANT SYSTEMS

### BASES

---

#### 3/4.7.4 EMERGENCY COOLING POND

The limitations on the [Emergency Cooling Pond \(ECP\)](#) volume and temperature are based on worst case initial conditions which could be present considering a simultaneous normal shutdown of Unit 1 and emergency shutdown of Unit 2 following a LOCA in Unit 2, using the ECP as a heat sink. The minimum indicated ECP level of 5.2 feet is based on soundings and includes measurement, calculation, and other uncertainties (equivalent to 0.15 feet) to ensure a minimum contained water volume of 70 acre-feet (equivalent to an indicated level of 5.05 feet), crediting operator action to initiate makeup to the ECP upon a loss of Dardanelle Reservoir event as discussed below. These soundings ensure degradation is within acceptable limits such that the indicated level is consistent with the required volume and the pond meets its design basis. The measured ECP temperature at the discharge from the pond is considered a conservative average of total pond conditions since solar gain, wind speed, and thermal current effects throughout the pond will essentially be at equilibrium conditions under initial stagnant conditions. Visual inspections are performed to ensure erosion, undercut caused by wave action, or any physical degradation is within acceptable limits to enable the ECP to fulfill its safety function. An engineering evaluation shall be performed by a qualified engineer of any apparent changes in visual appearance or other abnormal degradation within 7 days to determine operability.

The limitations on minimum water level and maximum temperature are based on providing a 30-day cooling water supply to Safety-related equipment without exceeding their design basis temperature and is consistent with the recommendations of Regulatory Guide 1.27, "Ultimate Heat Sink for Nuclear Plants," March 1974. Operator action is credited in the inventory analysis during the transfer of the [Service Water System \(SWS\)](#) to the pond. Specifically, pump returns are transferred to the pond shortly after a loss of lake event and pump suctions are transferred later in the event depending on pump bay level. In the time frame between the transfer of the returns and suctions to the pond, lake water is pumped into the pond, increasing level by at least 4.5 inches. This additional water is required, along with that maintained by Technical Specifications, to ensure a 66.9-inch pond depth, which ensures a 30-day supply of cooling water.

The LCO is modified by a Note which permits the ECP to be considered OPERABLE on a one-time basis for up to 65 days during upgrade of the ECP supply piping to the SWS intake bays provided:

- a. A loss of Lake Dardanelle event is not in progress, and
- b. A temporary pumping system is capable of supplying the SWS from the ECP. The temporary pumping system may be unavailable for testing or necessary maintenance provided its availability is restored within 72 hours, and
- c. The compensatory measures described in the ANO correspondence letter 0CAN022201, dated February 17, 2022, Enclosure, Attachment 4 shall be implemented. Failure to meet one or more of the continuing compliance compensatory measures is acceptable provided the measure(s) is/are restored within 72 hours.

For the purposes of the proposed LCO Note, a loss of Lake Dardanelle is considered an event that renders the Dardanelle Reservoir unavailable for an extended period of time, likely with no known time for recovery. Such events include failure of the downstream Dardanelle Dam, notification from the Army Corps of Engineers of more than a momentary draw down of lake level below 335 ft mean sea level (MSL), a major oil or chemical spill which renders Lake Dardanelle unfit for use to support cooling of station equipment, or any other event that would result in more than temporary lowering of the intake canal below 335 ft MSL.

## PLANT SYSTEMS

### BASES

---

#### 3/4.7.4 EMERGENCY COOLING POND (continued)

Other events that may require short duration use of the temporary pumping system such as clogging of SWS traveling screens are controlled by station procedures and are not considered a loss of Lake Dardanelle event with respect to this LCO Note.

Once the LCO Note is applied, the Note may be reapplied during startup should a unit shutdown occur during the 65-day period. If a unit shutdown occurred early in the 65-day maintenance window, the LCO would be exited upon entry into Mode 5; however, the LCO Note may be reapplied when entering Mode 4 from Mode 5, with the start of the 65-day allowable period being retroactive to the initial application of the LCO Note prior to the unit shutdown. For example, if a unit shutdown occurs 10 days following the commencement of the ECP piping upgrade and the unit remains in Mode 5 for 12 days, the proposed LCO Note may be reapplied upon entry into Mode 4 during plant restart; however, the time remaining in the original 65-day ECP piping upgrade window has now been reduced to 43 days ( $65 - 10 - 12 = 43$ ).

The temporary pumping system is capable of supplying the SWS from the ECP provided it can be aligned to at least two SWS bays during a loss of Lake Dardanelle event. Application of this LCO Note also requires the following continuing compliance compensatory measures to be maintained during the 65-day ECP supply piping upgrade. Unforeseen circumstances could arise that may prevent meeting one or more of the measures listed below. The ECP will remain operable provided the associated measure(s) is/are restored within 72 hours.

- The temporary pump will be tested and minimum flow requirements verified prior to removing the installed ECP supply piping from service. (One-time action)
- The Army Corps of Engineers will be briefed on the ECP piping upgrade activities and on the increased sensitivity of Lake Dardanelle level during the period of the ANO ECP piping upgrade. The Army Corps of Engineers will be requested to minimize any activity and provide advanced notification of activity that could impact the lake level or amount of debris in the lake. (One-time action)
- The 65-day allowance for the ECP to remain operable during the ECP supply piping upgrade will be applied only prior to a spring outage to provide additional margin to the TS maximum ECP temperature limit. (One-time action)
- The temporary pump system will be started to ensure its continued availability at least weekly. (Continuing compliance compensatory action)
- Personnel trained to start the pump will be dedicated and onsite 24 hours a day during the ECP piping upgrade when the ECP temporary pump is being relied upon as a backup for the Dardanelle Reservoir, with direct communications with the respective Control Room. (Continuing compliance compensatory action)
- During the ANO-2 ECP piping upgrade, equipment will be staged near each ECP pipe opening to allow pipe closure, within 48 hours, when external flooding is projected to exceed 350 ft MSL (Continuing compliance compensatory action)
- No elective maintenance or elective testing will be performed that could challenge the Dardanelle Reservoir SWS suction source. (Continuing compliance compensatory action)



## PLANT SYSTEMS

### BASES

---

#### 3/4.7.4 EMERGENCY COOLING POND (continued)

- The SWS pumps, bays, traveling screens, and sluice gates that are important for ensuring cooling water is provided to the supported SSCs will be given protected train status. (Continuing compliance compensatory action)
- The intake traveling screens will be inspected for debris and general physical condition at least once per shift. (Continuing compliance compensatory action)
- The accessible portions of the temporary ECP system piping will be inspected weekly. (Continuing compliance compensatory action)
- Fish nets will be installed in the Dardanelle Reservoir SWS intake canal when required by existing winter operations procedural guidance and inspected for any gross physical damage or large quantities of debris twice a week, weather permitting, to ensure the nets remain intact and capable of performing the intended function. (Continuing compliance compensatory action)
- An adequate fuel supply will be maintained to supply the temporary pump for approximately 24 hours of continuous operation. (Continuing compliance compensatory action)
- At least once per week, a briefing will be conducted for applicable personnel to ensure individuals remain cognizant of the cues that would prompt operator action to start the temporary pumping system and open the discharge valve. (Continuing compliance compensatory action)
- The ECP level will be maintained  $\geq 5.5$  ft during the 65-day preventative maintenance window. (Continuing compliance compensatory action)
- The risk impact will be reassessed against the acceptance guidelines for a small risk increase as defined in RG 1.177 Incremental Conditional Core Damage Probability (ICCDP)  $< 1E-6$  and Incremental Conditional Large Early Release Probability (ICLERP)  $< 1E-7$ ) prior to removing the installed ECP supply piping from service during the 65-day preventative maintenance window and will inform the NRC before proceeding if either criterion is not met. (One-time action)

The one-time actions identified above are performed prior to initial entry into the 65-day ECP piping upgrade window. Because unforeseen circumstances could arise that may temporarily prevent meeting one of the other continuing compliance confirmatory measures during the maintenance window, the LCO Note remains applicable (i.e., the ECP may be considered to remain operable) provided action is taken to restore the continuing compliance compensatory measures within 72 hours. This is considered reasonable since failure to meet one or more of the continuing compliance compensatory measures does not immediately render the temporary ECP pumping system unavailable.

Separate entry into the 72 hours is allowed for each continuing compliance compensatory measure specified above.

With the conditions associated with the LCO Note (as defined above) not met, the ECP may no longer be considered OPERABLE and Condition B becomes applicable.

ACTION "a" permits the use of the provisions of LCO 3.0.4.c. This allowance permits entry into the applicable MODE(s) while relying on the ACTION.

**ENCLOSURE, ATTACHMENT 3**

**0CAN022201**

**RE-TYPED TECHNICAL SPECIFICATION PAGES**

**(4 Pages)**

## 3.7 PLANT SYSTEMS

## 3.7.8 Emergency Cooling Pond (ECP)

LCO 3.7.8 The ECP shall be OPERABLE.

## -----NOTE-----

The ECP may be considered OPERABLE on a one-time basis for up to 65 days during upgrade of the ECP supply piping to the SWS intake bays provided:

- a. A loss of Lake Dardanelle event is not in progress, and
- b. A temporary pumping system is capable of supplying the SWS from the ECP. The temporary pumping system may be unavailable for testing or necessary maintenance provided its availability is restored within 72 hours, and
- c. The compensatory measures described in the ANO correspondence letter 0CAN022201, dated February 17, 2022, Enclosure, Attachment 4 shall be implemented. Failure to meet one or more of the continuing compliance compensatory measures is acceptable provided the measure(s) is/are restored within 72 hours.

APPLICABILITY: MODES 1, 2, 3, and 4.

## ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Degradation of the ECP noted pursuant to SR 3.7.8.4 below or by other inspection.	A.1 Determine ECP remains acceptable for continued operation.	7 days
B. Required Action and associated Completion Time of Condition A not met.  <u>OR</u>  LCO not met for reasons other than Condition A.	B.1 Be in MODE 3.  <u>AND</u>  B.2 Be in MODE 5.	6 hours    36 hours

## SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.8.1	Verify that the indicated water level of the ECP is greater than or equal to that required for an ECP volume of 70 acre-ft.	In accordance with the Surveillance Frequency Control Program
SR 3.7.8.2	<p>-----NOTE-----</p> <p>Only required to be performed from June 1 through September 30.</p> <p>-----</p> <p>Verify average water temperature is <math>\leq 100</math> °F.</p>	In accordance with the Surveillance Frequency Control Program
SR 3.7.8.3	<p>Perform soundings of the ECP to verify:</p> <ol style="list-style-type: none"> <li>1. A contained water volume of ECP <math>\geq 70</math> acre-feet, and</li> <li>2. The minimum indicated water level needed to ensure a volume of 70 acre-feet is maintained.</li> </ol>	In accordance with the Surveillance Frequency Control Program
SR 3.7.8.4	Perform visual inspection of the ECP to verify conformance with design requirements.	In accordance with the Surveillance Frequency Control Program

## PLANT SYSTEMS

### 3/4.7.4 EMERGENCY COOLING POND

#### LIMITING CONDITION FOR OPERATION

---

3.7.4.1 The emergency cooling pond (ECP) shall be OPERABLE<sup>1</sup> with:

- a. A minimum contained water volume of 70 acre-feet.
- b. An average water temperature of  $\leq 100$  °F.

APPLICABILITY: MODES 1, 2, 3 and 4.

#### ACTION:

- a. With the volume and/or temperature requirements of the above specification not satisfied or, with the requirements of Action b not met, be in at least HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours.
- b. If degradation is noted pursuant to 4.7.4.1.d below or by other inspection, perform an evaluation to determine that the ECP remains acceptable for continued operation within 7 days.

#### SURVEILLANCE REQUIREMENTS

---

4.7.4.1 The ECP shall be determined OPERABLE:

- a. In accordance with the Surveillance Frequency Control Program by verifying that the indicated water level of the ECP is greater than or equal to that required for an ECP volume of 70 acre-feet.
- b. In accordance with the Surveillance Frequency Control Program during the period of June 1 through September 30 by verifying that the pond's average water temperature at the point of discharge from the pond is within its limit.
- c. In accordance with the Surveillance Frequency Control Program by making soundings of the pond and verifying:
  1. A contained water volume of ECP  $\geq 70$  acre-feet, and
  2. The minimum indicated water level needed to ensure a volume of 70 acre-feet is maintained.
- d. In accordance with the Surveillance Frequency Control Program by performance of a visual inspection of the ECP to verify conformance with design requirements.

Note 1: The ECP may be considered OPERABLE on a one-time basis for up to 65 days during upgrade of the ECP supply piping to the SWS intake bays provided:

- a. A loss of Lake Dardanelle event is not in progress, and
- b. A temporary pumping system is capable of supplying the SWS from the ECP. The temporary pumping system may be unavailable for testing or necessary maintenance provided its availability is restored within 72 hours, and

## PLANT SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

---

- c. The compensatory measures described in the ANO correspondence letter 0CAN022201, dated February 17, 2022, Enclosure, Attachment 4 shall be implemented. Failure to meet one or more of the continuing compliance compensatory measures is acceptable provided the measure(s) is/are restored within 72 hours.







**ENCLOSURE, ATTACHMENT 4**

**0CAN022201**

**COMPENSATORY MEASURES**


### COMPENSATORY MEASURES

The following table identifies the compensatory measures to be taken by Entergy.

COMPENSATORY MEASURE	TYPE (check one)		SCHEDULED COMPLETION DATE
	ONE-TIME ACTION	CONTINUING COMPLIANCE	
The temporary pump will be tested and minimum flow requirements verified.			Prior to removing the installed ECP supply piping from service
The Army Corps of Engineers will be briefed on the ECP piping upgrade activities and on the increased sensitivity of Lake Dardanelle level during the period of the ANO ECP piping upgrade. The Army Corps will be requested to minimize any activity and provide advanced notification of activity that could impact the lake level or amount of debris in the lake.			Prior to removing the installed ECP supply piping from service
The 65-day allowance for the ECP to remain operable during the ECP supply piping upgrade will be applied only prior to a spring outage to provide additional margin to the TS maximum ECP temperature limit.			Prior to removing the installed ECP supply piping from service
The temporary pump system will be started to ensure its continued availability.			Weekly until buried ECP piping is returned to service
Personnel trained to start the pump will be dedicated and onsite 24 hours a day, stationed in reasonable proximity of the pump, during the ECP piping upgrade when the ECP temporary pump is being relied upon as a backup for the Dardanelle Reservoir, with direct communications with the respective ANO Control Room.			Ongoing until buried ECP piping is returned to service
During the ANO-2 ECP piping upgrade, equipment will be staged near each ECP pipe opening to allow pipe closure, within 48 hours, when external flooding is projected to exceed 350 ft MSL.			Ongoing until buried ECP piping is returned to service



COMPENSATORY MEASURE	TYPE (check one)		SCHEDULED COMPLETION DATE
	ONE-TIME ACTION	CONTINUING COMPLIANCE	
No elective maintenance or elective testing will be performed that could challenge the Dardanelle Reservoir SWS suction source.			Ongoing until buried ECP piping is returned to service
The SWS pumps, bays, traveling screens, and sluice gates that are important for ensuring cooling water is provided to the supported SSCs will be given protected train status.			Ongoing until buried ECP piping is returned to service
The intake traveling screens will be inspected for debris and general physical condition.			Once per shift until buried ECP piping is returned to service
The accessible portions of the temporary ECP system piping will be inspected.			Weekly until buried ECP piping is returned to service
Fish nets will be installed in the Dardanelle Reservoir SWS intake canal when required by existing winter operations procedural guidance and inspected for any gross physical damage or large quantities of debris to ensure the nets remain intact and capable of performing the intended function.			Bi-weekly (weather permitting) until buried ECP piping is returned to service
An adequate fuel supply will be maintained to supply the temporary pump for approximately 24 hours of continuous operation.			Ongoing until buried ECP piping is returned to service
A briefing will be conducted for applicable personnel to ensure individuals remain cognizant of the cues that would prompt Operator action to start the temporary pumping system and open the discharge valve.			Weekly until buried ECP piping is returned to service
The ECP level will be maintained $\geq 5.5$ ft.			Ongoing during the 65-day preventative maintenance window

COMPENSATORY MEASURE	TYPE (check one)		SCHEDULED COMPLETION DATE
	ONE-TIME ACTION	CONTINUING COMPLIANCE	
Entergy will reassess the risk impact against the acceptance guidelines for a small risk increase as defined in RG 1.177 (Incremental Conditional Core Damage Probability (ICCDP) < 1E-6 and Incremental Conditional Large Early Release Probability (ICLERP) and will inform the NRC before proceeding if either criterion is not met.			Prior to removing the installed ECP supply piping from service